

ABSTRACT OF THE DISCLOSURE

ZEB (zero excess bandwidth) modulation. The modulation rate of a signal is increased to the entirety of a communication channel's available bandwidth. Spectral zeroes at the edges of the available bandwidth now coincide with spectral zeroes at the edges of the Nyquist band and lead to ISI (intersymbol interference), which cannot be eliminated by equalization. Thus, in a ZEB system intersymbol interference (ISI) is intentionally allowed and dealt with by the known technique of TH (Tomlinson-Harashima) precoding. Comparison of conventional zero-ISI systems with ZEB systems, both exhibiting identical transmit spectra with finite spectral roll offs towards the edges of the available bandwidth, illustrate significant gains in channel throughput achievable by the ZEB systems. Similar gains can hardly be achieved by more sophisticated channel coding for zero-ISI systems. For ZEB systems an effective spectral shaping involving a simple infinite impulse response (IIR) of the overall channel is proposed.